WORLD INTELLECTUAL PROPERTY ORGANIZATION International Bureau



INTERNATIONAL APPLICATION PUBLISHED	ED U	JNDER THE PATENT COOPERATION	ON TREATY (PCT)	
(51) International Patent Classification 6: C08J 9/16, 9/00, C08F 12/08 // C08L 25:06 A	. 2	(11) International Publication Number:	WO 96/15182	
Cods 5/10, 5/00, Cost 12/08 // Cost 25:06 A	.3	(43) International Publication Date:	23 May 1996 (23.05.96)	
(21) International Application Number: PCT/EP95/0 (22) International Filing Date: 15 November 1995 (15.1)		CH, CN, CZ, DE, DK, EE, ES, I	FI, GB, GE, HU, IS, JP, KE, F, LU, LV, MD, MG, MK	
(30) Priority Data: 94203332.5 15 November 1994 (15.11.94)	E	SK, TJ, TM, TT, UA, UG, UZ, BE, CH, DE, DK, ES, FR, GB,	VN, European patent (AT, GR, IE, IT, LU, MC, NL,	

AT et al.

EΡ

(34) Countries for which the regional or international application was filed: AT et al. (71) Applicant: SHELL INTERNATIONALE RESEARCH

15 November 1994 (15.11.94)

(34) Countries for which the regional or

94203333.3

international application was filed:

MAATSCHAPPIJ B.V. [NL/NL]; Carel van Bylandtlaan 30, NL-2596 HR The Hague (NL).

(72) Inventors: PALEJA, Rakesh, Jaysinh; Avenue Jean Monnet 1, B-1348 Ottignies-Louvain-La-Neuve (BE). VLIERS, Dominique, Paul; Avenue Jean Monnet 1, B-1348 Ottignies-Louvain-La-Neuve (BE). WILLEMS, Maria, Johanna; Avenue Jean Monnet 1, B-1348 Ottignies-Louvain-La-Neuve (BE).

PT, SE), OAPI patent (BF, BJ, CF, CG, CI, CM, GA, GN, ML, MR, NE, SN, TD, TG), ARIPO patent (KE, LS, MW, SD, SZ, UG).

Published

With international search report.

(88) Date of publication of the international search report: 1 August 1996 (01.08.96)

(54) Title: EXPANDABLE BEADS BASED ON A POLYMER OF A VINYLAROMATIC COMPOUND CONTAINING BLOWING AGENT AND PLASTICIZER

(57) Abstract

The invention relates to expandable beads based on a polymer of a vinylaromatic compound having a weight average molecular weight (M_w) in the range of 180,000 to 500,000 and containing a blowing agent and a plasticizer in an amount of 0.1 up to 4 wt.% (as calculated on the total weight of the beads), wherein the plasticizer is an oligomer of styrene and/or alpha-methylstyrene having a number-average molecular weight (Mn) in the range of 200 to 2,000; a process for preparing these expandable beads, and articles of expanded beads, obtainable by expanding and fusing these beads.

FOR THE PURPOSES OF INFORMATION ONLY

Codes used to identify States party to the PCT on the front pages of pamphlets publishing international applications under the PCT.

AT AU BB BE BF BG BJ BR CA CF CG CH CN CS CZ DE DK ES FI FR GA	Austria Australia Barbados Belgium Burkina Faso Bulgaria Benin Brazil Belarus Canada Central African Republic Congo Switzerland Côte d'Ivoire Cameroon China Czechoslovakia Czech Republic Germany Denmark Spain Finland France Gaboon	GB GE GN GR HU IE IT JP KE KG KP KR LU LV MC MD MG ML MN	United Kingdom Georgia Guinea Greece Hungary Ireland Italy Japan Kenya Kyrgystan Democratic People's Republic of Korea Republic of Korea Kazakhstan Liechtenstein Sri Lanka Luxembourg Latvia Monaco Republic of Moldova Madagascar Mali Mongolia	MR MW NE NL NO NZ PL PT RO RU SE SI SK SN TG TJ TT UA US VN	Mauritania Malawi Niger Netherlands Norway New Zealand Poland Portugal Romania Russian Federation Sudan Sweden Slovenia Slovakia Senegal Chad Togo Tajikistan Trinidad and Tobago Ukraine United States of America Uzbekistan
--	--	---	---	---	---

INTERNATIONAL SEARCH REPORT

Inter and Application No PC1/EP 95/04511

A. CLASS	IFICATION OF SUBJECT MATTER	1.0.72. 33	701011
IPC 6	C08J9/16 C08J9/00 C08F12/0	8 //C08L25:06	·
	o international Patent Classification (IPC) or to both national classification	cation and IPC	
	S SEARCHED		
IPC 6	ocumentation searched (classification system followed by classification COSJ COSF COSL	on symbols)	
D	,		
Documenta	tion searched other than minimum documentation to the extent that si	ich documents are included in the fields se	tarched
Electronic d	ata base consulted during the international search (name of data base	and where practical search terms (mod)	
		where practical, search terms used)	
	•		
C. DOCUM	IENTS CONSIDERED TO BE RELEVANT		
Category *			
	Citation of document, with indication, where appropriate, of the rei-	evant passages	Relevant to claim No.
v ·	ED A 0 217 E16 (DOLL CUENTOAL OO		
•	EP,A,O 217 516 (DOW CHEMICAL CO ; CHEMICAL HELLAS (GR)) 8 April 1987		1-9
Υ	see page 6, line 10-26	'	0.0
	see page 9, line 8 - page 10, line	- 10	8,9
	see page 10. line 18-25	10	
	see page 11, line 17-24	İ	
	see page 17, line 1-10	• ()	,
	see claims 1-17	•	
,	US A A EQUIDE (HAUN MANS IT AL)		
'	US,A,4 520 135 (HAHN KLAUS ET AL) 1985	28 May	1-9
	see column 1, line 46-57	I	
	see column 2, line 15-18		
	see column 3, line 53-62		
	see column 6; table		
	see claim 1		
			•
	/	' '	
,	·		
X Furt	er documents are listed in the continuation of box C.	X Patent family members are listed in	annex.
Special cat	egories of cited documents :		
A* docume	nt defining the general state of the art which is not	later document published after the inter or priority date and not in conflict with	national filing date the application but
COUNTO	red to be of particular relevance	cited to understand the principle or the invention	ory underlying the
E earlier of filing d	locument but published on or after the international	document of particular relevance; the c	laimed invention
L' docume	nt which may throw doubts on priority claim(s) or	cannot be considered novel or cannot be involve an inventive step when the doct	oe considered to
arison	or orier special reason (as specified)	document of particular relevance; the ci	laimed invention
O' docume	nt referring to an oral disclosure, use, exhibition or	document is combined with one or mos	re other such docu-
P' docume	nt published prior to the international filing date but	ments, such combination being obvious in the art.	s to a person skilled
	at the priority date claimed	document member of the same patent f	amily
Serc Ol fue 1	ctual completion of the international search	Date of mailing of the international sear	rch report
16	April 1996	15-05-90	6
lame and m	ailing address of the ISA	Authorized officer	
	European Patent Office, P.B. 5818 Patentiaan 2 NL - 2280 HV Ripwijk		•
	Tel. (+31-70) 340-2040, Tx. 31 651 epo nl, Fax: (+31-70) 340-3016	Oudot, R	
	•	ondot, n	
m PCT/ISA/	110 (second sheet) (July 1992)		

INTERNATIONAL SEARCH REPORT

Inter and Application No
PC1/EP 95/04511

C.(Continue	thon) DOCUMENTS CONSIDERED TO BE RELEVANT	701/21 33/04311
Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A		
^	BE,A,633 239 (THE DOW CHEMICAL COMPANY) 5 December 1963	1-9
		·
		·

1

INTERNATIONAL SEARCH REPORT

Inter onal Application No PCI/EP 95/04511

Patent document cited in search report	Publication date	Patent family member(s)		Publication date	
EP-A-0217516	08-04-87	AU-B-	586879	27-07-89	
		AU-B-	6117786	19-02-87	
	•	CA-A-	1286165	16-07-91	
		DE-A-	3681241	10-10-91	
		IE-B-	59305	09-02-94	
		JP-B-	7039502	01-05-95	
		JP-A-	62104845	15-05-87	
US-A-4520135	28-05-85	NONE			
BE-A-633239		DE-B-	1265406		
,		FR-A-	1366197	10-11-64	
		GB-A-	1036448	== = = • •	
		NL-A-	293626		
		US-A-	3303159	07-02-67	

THIS PAGE BLANK (USPTO)